REMARKS

A proposed drawing correction is attached hereto for approval. A corrected drawing will follow in due coarse.

A revised Abstract of the Disclosure is attached hereto.

Claims 1 to 3, 5, 6, 8, 10, 14 and 15 were rejected under 35 U.S.C.103(a) as being unpatentable over Birleson (U.S. 6,163,684) in view of Fujii (U.S. 6,396,330B1). The rejection is respectfully traversed.

Claim 1 requires, among other features, a multi-loop frequency synthesizer having a translation phase locked loop having a unity multiplication factor driven by the fine tune signal, comprising a Gilbert cell double balanced mixer coupled between the coarse tune and the translation phase locked loops, the Gilbert cell mixer combining the coarse tune signal and a divided down output signal of the fine tune phase locked loop and coupling the mixed signal into the translation phase locked loop to generate an output signal with a frequency which is proportional to the linear sum of the coarse tune signal and the fine tune signal, the low multiplication factor and high bandwidth of the coarse tune loop and the unity multiplication factor of the translation loop reducing the phase noise of the frequency synthesizer. No such structure is taught or suggested by Birleson, Fujii or any proper combination of these references either alone or in the total combination as claimed. Nowhere does there appear to be an allegation that the PLL 2 of Birleson has a unity multiplication factor or the Gilbert cell in the manner claimed. f Furthermore, there is no teaching or suggestion to combine the references even were the combination to teach or suggest that which is claimed, which they do not.

Claims 2, 3, 5, 6, 8 and 10 depend from claim 1 and therefore define patentably over the applied references for at least the reasons presented above with reference to claim 1.

The features discussed above with reference to claim 1 are found in claim 14 in method format.

Claim 15 depends from claim 14 and therefore defines patentably over the applied references for at least the reasons presented above with reference to claim 1.

Claim 4 and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable ove Birleson in view of Fujii further in view of Bezzam et al. (U.S. 6,115,586). The rejection is respectfully traversed.

Claims 4 and 7 depend from claim 1 and therefore define patentably over the applied references for at least the reasons presented above with reference to claim 1 since Bezzam et al. fails to overcome the deficiencies in Birleson and Fujii as discussed above.

Claim 7 further limits claim 1 by requiring the frequency synthesizer of claim 1, wherein the translation phase locked loop includes a low pass filter coupled to receive the mixed signal output of the Gilbert cell double balanced mixer and to produce a filtered output signal, a phase detector coupled to receive the divided down fine tune signal and the filtered output signal of the low pass filter and to output a phase detection signal, a loop filter coupled to receive the phase detection signal and to output a tune voltage, a voltage controlled oscillator coupled to receive the tune voltage output of the loop filter and generate a signal frequency proportion to the tune voltage and a Gilbert cell double balanced mixer coupled between the coarse tune and the translation phase locked loops, the Gilbert cell mixer combining the coarse tune signal and the divided down output

signal of the fine tune phase locked loop and couples the mixed signal into the low pass filter of the translation loop, generating an output signal with a frequency which is proportional to the linear sum of the coarse tune signal and the fine tune signal. No such combination is taught or suggested by the applied references.

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson and Fujii in view of Dujmenovic (U.S. 2002/0118,308A1). The rejection is respectfully traversed.

Claim 9 depends from claim 8 which depends from claim 1 and accordingly defines patentably over the applied references for at least the reasons presented above with reference to claim 1.

Claim 9 further limits claim 8 by requiring that the divider within the fine tune and coarse tune phase locked loops include a dual modulus prescaler operably coupled to receive the phase locked loop output, wherein the dual modulus prescaler comprises a divide by n_M or n_M+1 element, where n_M or n_M+1 is an integer, and generates a divide by n_M or n_M+1 result output from the operation of the elements, a swallow divider operably coupled to the dual modulus prescaler, wherein the swallow divider comprises a divide by n_S element, where n_S is an integer, and determines a modulation frequency M for the dual modulus prescaler and a programmable divide by n_P element operably coupled to the output of the dual modulus prescaler, where n_P is an integer, and wherein the divide by n_P element is operable to divide the dual modulus prescaler output signal frequency by n_P, whereby the divider provides a signal frequency proportional to $(n_M \cdot n_P + n_S)f_{REF}$ or $(n_M+1 \cdot n_P + n_S)f_{REF}$ which comprises the divided down feedback signal. No such

combination is taught or suggested by the applied references since there is no teaching or suggestion to combine the references in the manner applied by the examiner.

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson in view of Fujii further in view of Hirata et al. (U.S. 5,353,311). The rejection is respectfully traversed.

Claim 11 depends from claim 3 and therefore defines patentably over the applied references for at least the reasons presented above with reference to claim 3. Furthermore, no such combination is taught or suggested by the applied references since there is no teaching or suggestion to combine the references in the manner applied by the examiner.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson in view of Fujii and Bezzam further in view of Caulfield et al. (U.S. 5,7573867. The rejection is respectfully traversed.

Claim 12 depends from claim 7 and therefore defines patentably over the applied references for at least the reasons presented above with reference to claim 7. Furthermore, no such combination is taught or suggested by the applied references since there is no teaching or suggestion to combine the references in the manner applied by the examiner.

The allowability of claim 13 and 16 when written in independent form is noted and appreciated.

In view of the above remarks, favorable reconsideration and allowance are respectfully requested.

Respectfully submitted,

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